In a more extensive investigation, KAPTEYN[9] regards it important that the data of tree growth, to be reliable, should be from trees in rather extensive forests, well situated with respect to subsoil water, and where the conditions over considerable areas are uniform. His own data were derived from annual ring measurements of oaks taken from the forests along the rivers Main, Moselle, and Rhine, and include the increments for the past two centuries. During this period the fluctuations in growth rate showed parallel variations in the three forests, and these variations correlated with meteorological records lead him to the conclusions that: (1) the very considerable fluctuations in the yearly growth of the oaks in the forests under consideration must, in large part, be due to meterological influences; (2) temperature has had a very small influence; (3) the rainfall of the spring and summer is the factor of the most importance, but its influence may be different for different kinds of trees; (4) increased growth seems to be caused by a greater supply of subsoil water rather than by any more direct action of greater precipitation; (5) for at least the last 70 years of the period there was but a single growth ring produced each year; (6) there appears to be a rather constant periodicity of 12.4 years in the rate of growth of these trees, and a comparison with some specimens of *Sequoia* from California would indicate a similar periodicity in their annual increment.

All these papers are suggestive rather than conclusive in their results, and indicate the importance of more extensive data before very definite conclusions can be reached.—GEO. D. FULLER.

First-generation maize hybrids.—COLLINS[10] has described a method of comparing the yield of first-generation hybrids between distinct varieties of maize with the yield of the parent varieties. The principal difficulties with methods heretofore in use are thought to have arisen from failure to appreciate (1) the importance of individual diversity in such hybrids as well as in the parent varieties, (2) the abnormal behavior of self-pollinated maize plants, and (3) the necessity of securing for the comparison hybrids and parents of identical ancestry. Briefly, the method suggested for obtaining the material for comparison is to select two plants, *1* and *2*, from each of two varieties, *A* and *B*, and by hand-pollination to make the four combinations represented by $A1 \times A2$, $A2 \times B1$, $B1 \times B2$, and $B2 \times A1$, resulting in one cross-pollinated ear of each variety and two ears representing the hybrid between the varieties. The reviewer does not doubt that, if a considerable number of these sets of four ears were similarly obtained, the method would afford an accurate means of comparing the yields of maize varieties as they exist with the yields of first-generation crosses between these varieties, and that it should therefore be of

[9] KAPTEYN, J. C., Tree growth and meteorological factors. Rec. Trav. Bot. Néerland. **11**:70–93. 1914.

[10] COLLINS, G. N., A more accurate method of comparing first-generation maize hybrids with their parents. Jour. Agric. Research **3**:85–91. 1914.

no little value in practical agronomic tests. But he is not prepared to accept the author's idea that the proposed method affords a reliable means of "measuring the effect of crossing apart from other factors that influence yield." The method does not afford a comparison between the hereditary yielding power (effect of genetic factors influencing yield) on the one hand, and on the other the effect of these same genetic factors plus the effect of crossing (heterozygosis ?). Since pronounced individual diversity exists in all ordinary maize varieties, the comparison offered is in reality between (1) the effect of certain genetic factors plus the effect of crossing between somewhat unlike individuals (an unknown degree of heterozygosis ?), and (2) the effect of the same genetic factors plus the effect of crossing between individuals presumably, though not necessarily, more unlike (a presumably considerable though wholly unknown degree of heterozygosis ?).—R. A. EMERSON.

Aspen in reforestation.—Experimental evidence is presented by PEARSON[11] of the extent to which the aspen assists in reforestation by promoting the vigor of conifer seedlings. The experiments were conducted by comparing the survival and condition of young Douglas fir (*Pseudotsuga Douglasii*) planted on similar areas with and without aspen cover, the results being decidedly better in the former localities. Measurements of the evaporating power of the air in the two situations show it to be decidedly less among the aspens, and to this is ascribed the better success of the young Douglas firs. Data upon soil moisture are less convincing, particularly from the absence of any constant, such as the wilting coefficient, to determine the availability of the moisture which is present. Incidentally, attention is directed to the importance of vegetative reproduction in the establishment of the aspens.—GEO. D. FULLER.

Sporophyte of liverworts.—Using the sporophyte of Hepaticae as a basis of classification, DOUIN[12] would make three groups as follows: those with the sporophyte reduced to a capsule (Ricciales); those with foot and capsule only (Anthocerotales); and those with foot, seta, and capsule (all of the rest of the liverworts). Although regarding the Anthocerotales as a very natural group, he objects strongly to making them coordinate with Hepaticae and Musci. The reviewer's recent studies of Mexican and Polynesian Anthocerotales, especially a form from Samoa, most emphatically bear out DOUIN's view. DOUIN concludes that the Jungermanniaceae Acrogynae, although now divided very artificially by various writers, are a far more natural assemblage than are the Anacrogynae, which as now arranged are the most artificial assemblage among Hepaticae.—W. J. G. LAND.

[11] PEARSON, G. A., The rôle of the aspen in the reforestation of the mountain burns in Arizona and New Mexico. Plant World **17**:249–260. 1914.

[12] DOUIN, ROBERT, Le sporophyte chez les Hepatiques. Rev. Gén. Botanique **24**: 403–413, 453–463. *pls. 18–21.* 1912.